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THE TREATMENT OF PENICILLIN RESISTANT MASTITIS

BY

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INTRODUCTION

Penicillin is accepted as the standard treatment of bovine mastitis due to *Streptococcus agalactiae*, and there is no doubt that results have on the whole fully justified the general use of this antibiotic.

Clinically it is difficult to differentiate the various infections responsible for the symptoms of mastitis, with the possible exception of *Corynebacterium pyogenes*, and therefore it is safe to say that in practice almost all cases of clinical mastitis in lactating cows are automatically treated with penicillin. The majority so treated show clinical improvement and are bacteriologically cured.

There is, however, a proportion which either show no clinical improvement or, more frequently, improve and later relapse and resist further penicillin therapy. There is evidence, at any rate in the south-eastern counties, that these types of cases are on the increase, and veterinary surgeons in practice are encountering problem herds where, in spite of regular penicillin treatment, mastitis cases keep occurring, especially at this time of the year when winter calvers are coming in.

In these herds laboratory investigations have shown that a coagulase-positive haemolytic *Staphylococcus aureus* is the commonest organism responsible for this state of affairs, whilst a bacteriological survey will reveal a variable number of sub-clinical infections, often with a previous history of mastitis. In the north-east midland area Hughes (1948) found that over 20 per cent. of 591 cows showed infection with potentially pathogenic staphylococci under somewhat similar circumstances. *Str. uberis* and *Str. dysgalactiae* cases are also occasionally seen. It is this type of infection which led to the search for an alternative therapy, especially in *Staph. aureus* cases. Stableforth and others (1949) dealing with herd eradication of *Str. agalactiae*, point out that whilst *Str. dysgalactiae* was usually eliminated by penicillin treatment, *Str. uberis* and staphylococcus infections may be reduced but not permanently sterilised.

DIBROMOPROPAMIDINE (M & B 1270)

This is a halogenated derivative of diamidino diphenoxy propane, or propamidine, and it has been shown by Wien and others (1948) that it has a marked bacteriostatic and bactericidal action against various Gram-positive and some Gram-negative organisms. Of those mentioned in this paper *Str. pyogenes* and *Str. viridans*, *Staph. aureus* and *Bacterium coli*, are of immediate interest.

It was decided to investigate the action of dibromopropamidine against the organisms responsible for mastitis, with special reference to staphylococci, and various strains of haemolytic staphylococci isolated from cases of mastitis were taken as test organisms, together with the standard penicillin-sensitive Oxford strain. The medium used was:

TABLE I

Strain of Staphylococcus	Drug-free medium	Concentration of dibromopropamidine				
		1	1	1	1	1
		8,030,000	4,030,000	2,030,000	1,040,000	509,000
At 24 hours' incubation—						
1 Blush	A	A	NG	NG	NG	NG
2 Strauss B4	A	A	NG	NG	NG	NG
3 Strauss T	A	A	NG	NG	NG	NG
4 Bridesmaid	A	A	NG	NG	NG	NG
5 Bird	A	A	A(S)	NG	NG	NG
6 Oxford	A	A	NG	NG	NG	NG
At 48 hours' incubation—						
1 Blush	A	A	NG	NG	NG	NG
2 Strauss B4	A	A	A	NG	NG	NG
3 Strauss T	A	A	A	NG	NG	NG
4 Bridesmaid	A	A	A	NG	NG	NG
5 Bird	A	A	A	NG	NG	NG
6 Oxford	A	A	NG	NG	NG	NG

Key: A = Growth, giving turbidity and acid production.
(S) = Incomplete change.
NG = No growth.

* Since deceased.

Bactopeptone 1 per cent.
Sodium chloride 0·5 per cent.
Glucose 0·5 per cent.
Bromo-cresol purple 1:40,000 at *p*H 7·4

The inoculum was 0·1 ml. of 1:10,000 dilution of 24-hour culture in trypsin digest broth. The results are shown in Table I.

It will be seen that dibromopropamidine in a concentration of 1:4,000,000 was bacteriostatic for five out of the six strains in 24 hours, and two out of the six in 48 hours. None of the strains grew in the 1:2,000,000 dilution. This result was considered promising and it was decided to repeat the test using milk as the medium, the other factors remaining constant.

The results are shown in Table II.

tions of sulphathiazole as shown in Table III. The results showed a synergism between the two compounds which was best seen at relative concentrations of dibromopropamidine: sulphathiazole 4:1.

With this information it was discovered that the bacteriostatic action of the amidine could be potentiated at least threefold in the presence of milk. This was an important point because previous work had indicated that the concentration of dibromopropamidine for udder injection should not exceed 4 per cent. and at this strength it did not always prove bacteriostatic in staphylococcal cases.

The next step was to test a combination of dibromopropamidine and sulphathiazole in cases of staphylococcal mastitis.

A preparation containing 200 mg. of dibromopro-

Table II

Strain of Staphylococcus	Drug-free medium	Concentration of dibromopropamidine 1 / 66,300	1 / 33,300	1 / 16,800	1 / 8,900	1 / 4,210
At 24 hours' incubation—						
1 Blush	AC	A(S)	NG	NG	NG	NG
2 Strauss B4	A(S)	A(S)	A(S)	NG	NG	NG
3 Strauss T	A(S)	A(S)	A(S)	NG	NG	NG
4 Bridesmaid	AC	A(S)	NG	NG	NG	NG
5 Bird	AC	AC	A(S)	NG	NG	NG
6 Oxford	A(S)	A(S)	NG	NG	NG	NG
At 48 hours' incubation—						
1 Blush	AC	AC	AC	A(S)	NG	NG
2 Strauss B4	AC	AC	AC	AC	A(S)	NG
3 Strauss T	AC	AC	AC	AC	A(S) C(S)	NG
4 Bridesmaid	AC	AC	AC	AC	A(S) C(S)	NG
5 Bird	AC	AC	AC	AC	NG	NG
6 Oxford	AC	AC	AC	AC	AC	NG

Key: A = Acid production.
C = Clot.
(S) = Incomplete change.
NG = No growth.

A comparison between these two experiments shows a marked drop in activity in the milk medium. After 48 hours a dilution of 1:8,900 prevented growth in two strains out of the six, whilst there was complete inhibition only at 1:4,210.

The milk medium was therefore responsible for a remarkable fall in activity from 1:2,000,000 down to 1:4,000.

Various experiments were carried out with the object of discovering what fraction of the milk was responsible for this reduction in activity, and it was finally demonstrated that dibromopropamidine was antagonised by lecithin. This phenomenon had already been reported by Elson (1944). A similar type of investigation was made using the sulphonamides, and by further experimentation it was ascertained that the action of sulphathiazole was potentiated by lecithin. In both cases the action, whether antagonism in the case of the amidine or potentiation in the case of the sulphonamide, was in direct proportion to the concentration of the lecithin.

It was therefore decided to test the combined action of dibromopropamidine and sulphathiazole in a milk medium against our standard mastitis strain of haemolytic staphylococcus.

The experiment was arranged in chessboard pattern with falling dilutions of the amidine with varying concentrapamidine and 50 mg. of sulphathiazole (*i.e.*, keeping the 4:1 ratio) was therefore prepared in 5 c.c. tubes of arachis oil and beeswax for udder injection and submitted to field trial. For brevity this preparation is hereafter referred to as DBP/ST.

Procedure

Milk samples were taken immediately before milking, with the usual precautions against contamination. On the same day as the samples were taken 0·06 ml. of milk was spread on the surface of one quarter of a calf-blood agar plate containing aesculin but no other inhibitory agent, and incubated at 37° C. for 24 hours.

Staphylococci were regarded as pathogens if they coagulated human or calf plasma by the slide and tube tests. Secondary attention was given to haemolysis and pigment production.

The mastitis streptococci were identified by their colonial appearance on the aesculin blood agar, plus biochemical reactions and where necessary group precipitation tests.

The majority of cases, including all sub-clinical infections referred to in this report occurred in four herds in which bacteriological surveys were done. In three of these herds beta-haemolytic coagulase-positive staphylococci were the predominating organisms. In the fourth the incidence

TABLE III

SYNERGISM BETWEEN SULPHATHIAZOLE AND DIBROMOPROPAMIDINE

Concentration sulphathiazole	Concentration dibromopropamidine							
	0	1/500,000	1/250,000	1/125,000	1/64,000	1/32,000	1/16,000	1/8,000
0	1	1	1	1	1	1	2	—
1/500,000	2	2	2	2	2	2	—	—
1/250,000	2	2	2	2	2	3	—	—
1/125,000	2	3	3	4	4	—	—	—
1/64,000	3	3	4	5	5	—	—	—
1/32,000	4	4	4	6	—	—	—	—

Key: 1–6 Number of days' incubation to give acid and clot in milk.
— Growth completely inhibited.

Str. agalactiae infection was high ; many of the cows had teat sores and milk samples frequently contained small numbers of haemolytic staphylococci also, but these were disregarded in this herd. Besides these four herds a few clinical cases of mastitis which failed to respond to penicillin are included in the report.

No case was treated unless two consecutive milk samples were positive. Bulk samples (*i.e.*, one per cow) were taken first, followed seven days later by quarter-samples from all suspected cases. Before treatment only samples positive on direct plating were accepted in the case of streptococci, and in the case of staphylococci six colonies per plate was regarded as the minimum infection (approximately 100 organisms per 1 ml. milk).

The test of cure after treatment was more stringent, as it included examination of incubated milk samples. Absence of the infecting organisms from not less than two consecutive samples taken at weekly intervals was accepted as a cure. The cases have then been followed up at varying intervals to detect relapses. It is proposed to continue this up to the following lactation in as many cases as possible.

TREATMENT

A course of treatment consisted of four tubes of DBP/ST per quarter, one being injected after milking (twice daily) at four consecutive milkings. Milk samples were taken on the seventh day after the first injection, and if found still infected a second or third course of the same treatment was given and the bacteriological examination repeated each week.

RESULTS

(*a*) *Staph. aureus*

27 cows with 40 infected quarters were treated. Of these, ten cows (14 quarters) were clinically affected and 17 cows (26 quarters) were sub-clinical infections. Clinically affected means that there was either hardness of the quarter or visible abnormality of the milk, or both. Infected quarters only were treated.

13 cows (20 quarters) including five quarters clinically affected and 15 sub-clinically, were cured with one course of treatment. Of these, two cows (three quarters) relapsed within nine weeks and were re-treated and cured again, at least temporarily. 8 cows (12 quarters) including one clinically affected were cured after two courses of treatment. One of these (one quarter) relapsed in four weeks and another (two quarters) within nine weeks. Both were subsequently cleared up with a further course of treatment.

All treated cows have now been examined at nine weeks, eleven weeks, or longer, after first being cured and, apart from those mentioned, they remained clear. Six cases failed to clear up with three or more courses of DBP/ST. Five of these were in one herd and all had very marked old-standing induration of the affected quarters, with milk apparently normal. One of them was cured by penicillin after failing to respond to three courses of DBP/ST. This case has been sampled five times within four months after the penicillin treatment and so far has not become re-infected. The sixth was a clinical case of long standing. Fibrosis had resulted in shrinking of the quarter and the milk contained clots intermittently. After three courses of DBP/ST this case was treated with penicillin and cleared up but later relapsed.

(*b*) *Str. agalactiae*

22 cows were treated with one or more quarters infected. These included two clinical cases and 20 sub-clinical. All four quarters were injected as a routine. Fifteen cases were cured with one course and two by two courses. Of the remainder, one failed to clear up after two courses and in the other four the treatment was changed to penicillin after one course of DBP/ST. It was considered that further trial in *Str. agalactiae* mastitis in this herd was not justified on account of occasional reactions in the form of blood-tinged milk, and the fact that penicillin treatment proved equally effective. These cases have not been followed up.

(*c*) *Str. uberis*

Only five cows with six infected quarters have been treated. One of these was a mild clinical case and the remainder sub-clinical. The four sub-clinical cases (five quarters) were cured with one course of treatment and have remained clear for a minimum of eight to eleven weeks. The clinical case responded to two courses of treatment and was clear of infection six weeks after the last injection.

(*d*) *Other Streptococci*

One case of *Str. dysgalactiae* infection (sub-clinical) was encountered and responded to one course of treatment and has remained clear for ten weeks.

An acute clinical case of mastitis in three quarters, accompanied by general toxaemia, was found to be due to a beta-haemolytic streptococcus of Group G. This case had been

TABLE IV

SUMMARY OF THE NUMBER OF COWS TREATED WITH DBP/ST AND RESULTS

Infection	Total number treated		Cured				Failed	
			1st course		2nd course			
	Clin.	Sub.	Clin.	Sub.	Clin.	Sub.	Clin.	Sub.
Staphylococcus aureus	10(14)	17(26)	3(5)	10(15)	1(1)	7(11)	6(8)	0
Streptococcus agalactiae	2	20	1	14	1	1	0	1 (Other four given one course only)
Streptococcus uberis	1(1)	4(5)	0	4(5)	1(1)	0	0	0

The numbers in brackets refer to quarters of the udder.

treated previously with penicillin and showed only temporary improvement, followed by relapse. The clinical response to the first course of DBP/ST was immediate and striking, but three courses were required to effect a bacteriological cure. The milk has now been sterile for two months, although it contains traces of blood. The cow has improved in condition.

TOLERANCE

Preliminary tests in normal udders showed that dibromopropamidine could not be used in concentrations above 5 per cent. without causing some slight inflammatory reaction in the quarter. The preparation of DBP/ST used in these trials causes a very slight reaction in the normal quarter as shown only by increased cell counts in the milk immediately after injection. Its clinical use is sometimes followed by the presence of small white clots in the foremilk for a few days. In none of the sub-clinical mastitis cases treated has there been any evidence of lasting damage and the milk yield has either remained unchanged or has increased after treatment. Five cases have now been followed up to their ensuing lactation and all are showing heavier milk yields than previously. While treating cows infected with *Str. agalactiae* it was first observed that the milk samples drawn from treated quarters were occasionally pink-tinged. This was found to be due to the presence of red blood cells. In a few cases this reaction was marked and persisted for a week or even longer after treatment. A similar occurrence has since been observed in two staphylococcal cases, but we have been unable to reproduce anything like it experimentally by repeated injection of normal udders. It is thought to be the result of a slight irritant effect of the injection in an already inflamed mammary gland, but there is no evidence of any permanent damage resulting.

SUMMARY AND CONCLUSIONS

In vitro studies with dibromopropamidine are described demonstrating (a) interference with the antibacterial activity of the compound by milk compared with peptone broth as a medium, and (b) a synergistic effect between this compound and sulphathiazole against *Staph. aureus* in milk.

A preparation containing 200 mg. dibromopropamidine isethionate and 50 mg. sulphathiazole in 5 c.c. of an arachis oil-beeswax base has been used in the field by intramammary injection in treating a number of cows with udder infections (clinical and sub-clinical). These were occurring in herds where penicillin had been used as a routine treatment for some years.

Promising results were obtained in cases caused by *Staph. aureus* and *Str. uberis*, and the injections were well tolerated on the whole. In *Str. agalactiae* infections the treatment appeared to be effective but reactions to injection were rather more marked and frequent.

It is concluded that the preparation is worthy of further trial in penicillin-resistant mastitis.

Acknowledgments.—We wish to thank Messrs. W. F. Barton, H. G. McShane and P. J. Mitchell, MS.R.C.V.S., for putting herds and cases at our disposal for this investigation. We are also grateful to the farmers concerned for their helpful co-operation.

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HUGHES, D. L. (1948.) *Vet. Rec.* **60.** 659.
STABLEFORTH, A. W., *et al.* (1949.) *Vet. Rec.* **61.** 357.
WIEN, R., HARRISON, J., FREEMAN, W. A. (1948.) *Lancet* **1.** 711.

CANADIAN CHANGES IN LIVESTOCK IMPORT REGULATIONS

In amplification of the note on overseas changes in live stock import regulations published in our issue of January 7th, we reproduce below the following notification of changes in the Canadian import regulations issued by the Ministry of Agriculture to the Livestock Export Group:—

Johne's Disease.—The regulation relating to the johnin test is being replaced by the requirement that cattle and sheep from Great Britain (provided that they are otherwise healthy) will be accepted for entry into Canada if they are accompanied by a certificate signed or endorsed by a veterinarian employed full-time by the Ministry to the effect that to the best of his knowledge and belief Johne's disease is not present in the herd or flock of origin and the animals have not been exposed to infection with Johne's disease.

In the case of animals being exported through a quarantine station this certificate will be issued by the Divisional Inspector (or deputy) of the Ministry when making his inspection of animals on the premises of origin. In the case of animals shipped direct from Scotland without passing through a quarantine station the certificate should be signed by a Local Veterinary Inspector of the Ministry and endorsed by the Divisional Inspector concerned (or his deputy).

Brucellosis.—Cattle up to thirty months of age will now be accepted for entry into Canada from Great Britain, whether negative or positive to the blood agglutination test for Brucellosis, provided that they have been inoculated with *Brucella abortus* Strain 19 vaccine, between the ages of four and eight months, and also provided that a certificate to that effect is signed or endorsed by a veterinarian employed full-time by the Ministry. It is emphasised that this amendment applies to animals destined for Canada only.

BOVINE TRYPANOSOMIASIS IN THE SUDAN: MASS TREATMENT WITH ANTRYCIDE

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Incidence

A serious epizootic of bovine trypanosomiasis developed a few years ago in the Southern Sudan in a large cattle rearing area covering about 100,000 square miles of country which is believed to be free from tsetse flies. Other biting flies are always plentiful there during most of the year and it was presumed that they transmitted the disease mechanically.

Trypanosoma congolense appeared to be responsible for the great majority of the cases and *T. vivax* for the remainder. Losses from the disease were estimated to be well over 100,000 cattle a year.

The first attempt to control the epizootic was in 1947–48 when virtually all the cattle (over 350,000) in an area of about 20,000 square miles were inoculated with dimidium bromide (Evans, 1948). Although toxic symptoms resembling photosensitisation developed in some of the treated cattle and about 1 per cent. of the total died as a result, the campaign was then considered to be satisfactory because it reduced losses to negligible numbers. Inspection of the treated cattle a year to 18 months after treatment showed them to be in excellent condition. Their owners were universally emphatic that trypanosomiasis had disappeared from their herds and the negative results of blood examinations of representative groups of cattle from many herds supported their contention. The inexplicable toxic reaction in some cattle, and the possibility of heavy casualties following inoculation, could not, however, be ignored and when experimental work showed that antrycide was more effective therapeutically and much safer to administer, the use of dimidium bromide was suspended.

Experimental Treatment

The Sudan Veterinary Service co-operated with Dr. D. G. Davey, of Imperial Chemical Industries Limited, in experimental work in the Sudan on the chemotherapeutic values of the dichloride and methylsulphate salts of antrycide for *T. congolense* and *T. vivax* infections in cattle. A full report of his results is in the press (Davey). Dr. Davey found in the Sudan and East Africa that antrycide methylsulphate cured different cattle infected with three strains of *T. congolense*, at a dosage of 1·0 mg. per kg. bodyweight, and cattle infected with a fourth strain at a dosage of 2·0 mg. per kg. bodyweight. His work on the chemotherapy of *T. vivax* infection was not so complete and his conclusion on the two strains tested was that "1·0 mg. per kg. was not sufficient to cure all animals, but 5·0 mg. per kg. was."

Large-scale Treatment

A field trial, involving the inoculation of nearly 300 cattle in which the incidence of trypanosomiasis was high, was carried out and the results were very satisfactory. No casualties followed inoculation and the treated cattle thrived during the following six months, while, in contrast, trypanosomiasis continued to take a heavy toll in neighbouring untreated herds. When these results were obtained further delay in using antrycide methylsulphate extensively appeared to be unwarranted, in view of the rapidly mounting losses from the epizootic. Plans were therefore made to start large-scale inoculations as soon as the manufacturers could supply a substantial quantity of the drug.

It was decided to inoculate the drug subcutaneously as a 15 per cent. aqueous solution at an estimated dosage of 5·0 mg. per kg. bodyweight. At this dosage generous latitude was being allowed for ensuring that all cattle infected with *T. congolense* (*i.e.*, the immense majority of the total cattle infected) would be cured, and it was considered that at least most of those infected with *T. vivax* would also be cured. In any case, it seemed inadvisable to recommend a higher dosage because, even at 5·0 mg. per kg., some cattle, particularly young stock or those infected with intercurrent disease, became distressed immediately after inoculation and two or three in 1,000 collapsed. Although complete recovery usually occurred shortly afterwards it was essential to avoid such severe reactions as much as possible, otherwise the acceptance of the drug by native cattle owners would be seriously prejudiced. An attempt to minimise their frequency was made by slightly reducing the standard dose when inoculating young animals.

The plan of campaign, which resembled that for dimidium bromide referred to earlier, was to aim at inoculating *all* the cattle in one part of the infected area and so produce a block of cattle virtually free from trypanosomiasis. A start was made in January, 1949, and by the end of June, when operations had to be temporarily suspended on account of climatic conditions, some 200,000 cattle in an area of about 20,000 square miles had been inoculated. On an average, about one-quarter of these cattle showed clinical symptoms of trypanosomiasis prior to inoculation, but in many herds the proportion was very much higher.

Small, firm swellings usually developed at the inoculation sites. Occasionally bigger ones were seen but they caused no inconvenience unless incised by the owner. Approximately a quarter of the treated cattle showed copious salivation which lasted for several hours and most of the young stock were off their food for the rest of the day. Early in the campaign a few very young calves died within 24 hours of treatment and it was then decided not to inoculate any more under the age of six months.

The results of the campaign were spectacularly satisfactory. Several thousands of the cattle, many of them from the worst infected herds, were inspected three to four months after treatment and were seen to be in good condition. The owners were very pleased with the results and stated that losses from the disease had ceased. They frequently pointed out with pride certain cows which could not get up at the time of inoculation but were then active and thriving. Blood examinations of representative groups of cattle from many herds were made but no trypanosomes were found. More recent reports, many of them from areas which have been flooded and consequently inaccessible for several months, speak of unqualified satisfaction with the results of the treatment.

The campaign has since been resumed with the intention of inoculating a further 150,000–200,000 cattle during the winter months.

Summary

An account is given of a large-scale campaign against bovine trypanosomiasis in the Southern Sudan by the subcutaneous inoculation of antrycide methylsulphate. Both *T. congolense* and *T. vivax* were responsible for the disease but the former was by far the more common cause. Virtually all the 200,000 cattle in a part of the infected area were inoculated during the first six months of 1949 and the results of the treatment appear to be excellent.

Acknowledgments.—I acknowledge with gratitude advice

(*Concluded at foot of col.* 1, *p.* 60)

CLINICAL COMMUNICATION

TOXICITY FOLLOWING THE DAILY USE OF PHENAMIDINE (M. & B.) IN THE DOG*

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The first 21 of the last 23 cases of demodectic mange encountered in this practice have been treated with injections of Phenamidine (M. & B.) administered on six occasions at intervals of three or four days, using the dosage factor of 0·3 c.c. per kg. recommended by the manufacturers.

The 22nd and 23rd cases had both received prolonged external applications, and it was decided to institute Phenamidine therapy. The pamphlet accompanying this product is most reassuring about its lack of toxicity. Furthermore, our own experience of reactions led us to believe that these would be confined to a disturbance easily controlled by injection of Antisthan (M. & B.) when necessary.

The presumption was made that each dose of the drug was probably eliminated after 24 hours or so.

It was thought that, if the demodectic mite can become in any degree drug fast, more intensive therapy would perhaps overcome this and therefore a subsequent relapse[1] would be avoided. Lastly, a more rapid response was hoped for.

Two cases were given Phenamidine at daily intervals, and at the rate of 0·3 c.c. per kg. as recommended. Both cases died suddenly from the cumulative effects of this drug. Both dogs exhibited a similar syndrome.

CASE I

On the fourth day, having received three injections, this patient when presented was seen to be showing slight muscular weakness and unsteadiness of gait, and dosage was withheld. Two hours later the bitch was found in a severe clonic convulsive state. This was temporarily controlled by sedation with "Seconal" (Lilly), but as the effect of this diminished, marked strychnine-like convulsions reappeared. There was strong extension of all limbs and the neck, but the back was arched and the pupils pin point; urine retention was noted; there was severe congestion of mucous membranes.

CASE II

Nine daily injections were given to this case, together with supplementary local treatment. The patient was improving satisfactorily. On the eleventh day she suffered a very sudden attack. She was found in the kennels in a state closely resembling a continuous distemper meningeal fit. Pupils were constricted and all the symptoms observed in Case I were apparent.

DIAGNOSIS.—Phenamidine poisoning.

TREATMENT.—Both cases occurred in kennels on the same day, and within two hours of each other. Light anaesthesia was induced with "Kemithal" (I.C.I.) and each patient was started on a continuous intravenous drip of normal saline with 5 per cent. glucose. Additional quantities of "Kemithal" were added to the saline to maintain reasonable immobility and freedom from convulsions.

It was hoped to excrete the Phenamidine through the kidneys. Case I, the smaller of the two, was given 3,000 c.c. of saline in ten hours, and Case II, 3,500 c.c. in eleven hours, when death supervened in both. At intervals Case II was given appropriate doses of d-Tubocurarine chloride (Abbott), nicotinic acid, magnesium sulphate per infusion. After 1,500 c.c. of solution had been administered no urine whatever had been passed, and as the bladder was not filling, 1·5 c.c. Neptal (M. & B.) were given intravenously.

Case I had passed copious quantities of urine, but had received as diuretic 250 c.c. of a 4·2 per cent. solution of sodium sulphate.[2]

CONCLUSIONS

Administration to the dog of Phenamidine (M. & B.) at the rate of 0·3 c.c. per kg. at 24 hourly intervals permits the drug to accumulate to a toxic threshold.

Manifestations of this toxicity may be delayed for two days.

The suddenness and severity of the condition when first observed gave us a strong clinical impression that death would ensue. All antidotal treatment tried was without apparent benefit in spite of the adoption of admittedly heroic measures, some of which may even have been contra-indicated but were felt to be justified in the circumstances.

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1 KIRK (1949.) *Vet. Rec.* **61.** 394.
LANDER (1949.) *Ibid.* **61.** 434.
2 WARD, B., *Proc. Roy. Soc. Med.* **30.** 144.

*It should be emphasised that somewhat more intensive therapy than that advised by the makers of this product, Messrs. May & Baker, was adopted deliberately for the reasons given.

freely given by Dr. D. G. Davey, both during his stay in the Sudan and afterwards, and the help afforded by his technical assistant, Mr. A. S. Taylor. Messrs. P. Durran and D. G. Clow, of the Sudan Veterinary Service, were responsible for the heavy task of inoculating all the cattle and I am indebted to them for the account of the immediate reactions to the treatment. I thank the Director, Sudan Veterinary Service, for permission to publish this account.

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REMOVAL OF RESTRICTIONS ON THE MOVEMENT OF SWINE

In consequence of the decline in the number of outbreaks of swine fever in Great Britain during the past three years, the Minister of Agriculture and Fisheries has decided that no sufficient reason now exists for maintaining the restrictions contained in the Regulation of Movement of Swine Order of 1922 and its amending Orders, and the Orders in question have accordingly been revoked with effect from February 1st, 1950.

Copies of the Order bringing this decision into effect (The Regulation of Movement of Swine (Revocation) Order, 1950) may be obtained from Animal Health Division, Ministry of Agriculture and Fisheries, 28-32, Chester Terrace, Regent's Park, London, N.W.1, or through H.M. Stationery Office.

* * * * *

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

SHEEP SCAB:

Cumberland.—Haresceough Cottage, Garth, Renwick, Penrith, Cumberland (January 19th).

Lancashire.—Bowes Edge Farm, Colne (January 20th).

REVIEW

[" Klinische Diagnostik der innere Erkrankungen und Hautkrankheiten der Haustiere." 148 illustrations. By Dr. D. Wirth. Vienna. (Vienna: Urban & Schwarzenberg.)]

The Teutonic mind runs to method and order; this makes their historians unreadable save by other historians, their philosophers among the greatest masters of platitude, but their scientists of immense value for their painstaking groundwork. The work under review certainly falls into this category; there is unfortunately nothing comparable in English. It is a most thorough description and analysis of routine investigation into and diagnosis of disease, both in farm and household animals and poultry. General methods are considered first—restraint, a routine for making examination thorough and complete; then detailed consideration of clinical symptoms and their meaning; then regional examination (*e.g.*, nostrils, mouth, eyes, poll, neck, chest, etc.), and points to seek and assess. The author then proceeds to discuss and explain the significance of abnormalities of pulse, temperature, breathing, heart, faeces, urine; and describes the methods (percussion, auscultation, etc.) by which these abnormalities may be detected. Among the most useful sections is one on rectal examination and what may be learned from it. Finally, some biochemical and haematological aids are described, and their value assessed as aids to diagnosis of certain conditions. The illustrations and diagrams are evidently most carefully chosen, and are of much help in clarifying and stressing the points made in the text.

Many of us tend to become hasty and " instinctive " in our diagnoses; to any such this work would if available in translation, prove a most useful corrective; and one feels that it would enable almost any final year student to defeat his examiners in medicine.

ABSTRACT

[Louping-ill Meningo-encephalitis. A Further Case and a Serological Survey. Lawson, J. H., *et al.* (1949.) *Lancet.* **257.** 696–699.]

The authors report a further case of louping-ill in humans. This occurred in a slaughterman. Diagnosis depended upon the biphasic character of the symptoms and a positive result to a specific serum neutralisation test. No opportunity was afforded to attempt the isolation of the virus. Attention is drawn to the variation in symptoms noted in the first phase when, it is contended, a systemic multiplication of the virus takes place. This is followed by an invasion of the C.N.S. by the virus. The similarity between the biphasic character of this and other virus infections in humans and animals is discussed and the view expressed that this is probably a constant feature of louping-ill in humans. Contrary to laboratory infections (droplet) it would seem that in field infections the tick bite is the only means of transmission. A serological survey of 38 of the patient's co-workers, in none of whom (with the exception of some cases of " influenza ") was there a history suggestive of louping-ill, showed that three were positive and three doubtful. On the basis of their serological results, the authors suggest that if such surveys were more widely undertaken, instances of infection in humans might be brought to light and provide a clearer picture of the actual incidence of the disease in humans.

W. T. R.

VICTORIA VETERINARY BENEVOLENT FUND

MEETING OF COUNCIL

A meeting of the Council of the Victoria Veterinary Benevolent Fund was held at No. 10, Red Lion Square, London, W.C.1, on Wednesday, December 14th, 1949, when the following members were present: Mr. Arnold Spicer (President) in the chair, Mr. Horace Bell, Dr. W. R. Wooldridge and Major W. H. Wortley. Mr. C. W. Francis, Accountant, was in attendance.

Minutes.—The minutes of the previous Council Meeting, having been published, were taken as read and signed as correct.

Apologies for Absence.—Apologies for absence were received from Mr. and Mrs. G. N. Gould, Professor and Mrs. R. E. Glover, Mr. John Holroyd, Professor J. McCunn, Capt. W. R. McKinna, Professor W. M. Mitchell, Mrs. B. W. Hills-Owen (President, V.V.B.F. Ladies' Guild), Mr. H. W. Steele-Bodger, Capts. Wm. Watt and A. Whicher, and Mrs. W. R. Wooldridge.

CASES

It was reported that the grants in the following cases had been discontinued owing to the deaths of the recipients:—

No. 148, widow, died October 27th, 1949. 10s. 6d. per week.

No. 175, widow, died September 26th, 1949. 15s. per week.

No. 140, widow, died August 16th, 1949 (case recently taken over by the N.V.B. & M.D. Society).

No. 268, M.R.C.V.S., died July 29th, 1949. 40s. per week.

Other Cases

No. 52, widow, aged 70. £2 per week. Receiving Old Age Pension of 10s. per week. Question now being considered of increased pension and its effect on the Fund's grant. It was agreed that this case be held over to the next meeting.

No. 220, widow, aged 47. Renewed application for assistance. After further investigation and with the help of a report from a member of a Branch of the Ladies' Guild, the Executive Committee decided to adhere to its decision made in February, 1949 that no grant be made in this case.

No. 270, widow, aged 54. This case was considered by the Executive Committee who decided that a grant of £1 per week be made as from November 1st, 1949.

No. 271, M.R.C.V.S., aged 48. Suffering from nervous breakdown, having lost his practice and now living on the generosity of former clients. The Executive Committee agreed that a grant of £8 13s. 4d. per month, commencing from November 1st, 1949, be made in this case.

It was resolved that the action taken by the Executive Committee in cases Nos. 220, 270 and 271 be approved.

Investments.—In the absence of the Hon. Treasurer, the Accountant reported the following investments which had been made since the last meeting:—

(i) *Hunting Fund Account.*—£410 8s. 4d., being balance for 1948, as disclosed by the Balance Sheet, invested in the purchase of £454 10s. 4d. British Transport Guaranteed Stock, 3 per cent., 1978/88, in the name of the Victoria Veterinary Benevolent Fund.

(ii) *Wortley Axe Fund.*—The balance of £208 12s. 2d. standing in this account was invested in the purchase of £215 9s. 10d. 2½ per cent. Funding Stock (all the Capital in this account being in this security).

(iii) *Donations Account.*—The balance as on August 24th, 1949, amounting to £450, was invested on that date in purchasing £472 5s. 3d. War Loan.

The action of the Hon. Treasurer was approved and he was authorised to invest the balance now standing in the Donations Account in a suitable security.

ACCOUNTANT'S REPORT

The following report of the Accountant was read and adopted :—

Since the previous meeting of Council, the following Donations, etc., have been received :—

DONATIONS

Collecting Boxes

	£	s.	d.	£	s.	d.
Central Veterinary Society	1	7	10			
J. L. Cormack	3	3	0			
East Midland N.V.M.A.	4	8	6			
Eastern Counties Veterinary Society ...	10	0	11			
Eastern Counties Shipley Cup Collection ...	8	4	0			
G. N. Gould	3	4	6			
Lincolnshire and District V.M.A.	4	18	10			
J. J. Low	2	10	7			
C. Masson	1	10	0			
J. T. Morton	2	8	6			
North of England Veterinary Medical Association	3	18	3			
North Wales Division	3	19	9			
C. M. W. Park	0	10	0			
Pugh & Bruford	0	11	0			
Rix & Rix (per Major J. D. Rennie) ...	4	15	0			
Royal Counties Veterinary Medical Association	11	5	1			
Scottish Branch, N.V.M.A.	3	6	7			
Scottish Metropolitan Division, N.V.M.A. ...	3	7	6			
South-Eastern Veterinary Association ...	8	12	0			
H. W. Steele-Bodger	1	2	8			
Sussex Division N.V.M.A.	9	0	9			
Western Counties Veterinary Medical Association	12	2	0			
A. Whicher	4	17	3			
Major W. H. Wortley	0	14	6			
Yorkshire Veterinary Medical Association	5	0	0			
Total Collecting Boxes				114	19	0
Association of Veterinary State Officers				5	5	0
Association of Veterinary Teachers and Research Workers				10	0	0
Bexhill Horse Show (per A. Whicher)				10	0	0
J. J. Davies				0	15	0
Hong Kong Jockey Club				10	0	0
In Memory of H. D. Jones				3	1	0
Professor J. McCunn (Life Membership)				10	10	0
Miss Mappin (per A. Whicher)				2	10	0
National Greyhound Racing Club				5	0	0
R.(D.)V.C., Staff Collection *re* Late Stanley Murphy (Balance)				0	5	0
In Memory of Professor E. S. Shave				6	16	0
Mrs. M. Sheppard (in Memory of her Husband)				13	5	0
Veterinary Medical Association of Ireland, Entertainment Tax Refund in Connection with Greyhound Charity Meeting				78	3	0
				£270	9	0

Special Contributions

	£	s.	d.
V.V.B.F. Ladies' Guild, for Current Relief	300	0	0
V.V.B.F. Ladies' Guild for Christmas Fund	150	0	0
	£450	0	0

It was resolved " That the grateful thanks of the Council be conveyed to the respective donors."

Life Membership.—It was resolved " That Professor J. McCunn be elected a Life Member of the Fund."

The meeting then terminated.

WEEKLY WISDOM

I shall try to correct errors where shown to be errors ; and I shall adopt new views as fast as they shall appear to be true views.—ABRAHAM LINCOLN.

NOTES AND NEWS

Diary of Events

Feb. 9th.—First Annual Ball of the Glasgow University Veterinary Medical Association, in the Prince of Wales' Halls, 350, Sauchiehall Street, Glasgow.

Feb. 9th.—Joint Meeting of the Association for the Study of Animal Behaviour and the British Society of Animal Production, in the meeting rooms of the Zoological Society of London, Regent's Park, N.W.8.

Feb. 14th.—Scientific Meeting of the Zoological Society of London, at Regent's Park, N.W.8, 5 p.m.

Feb. 15th.—Meeting of the Royal Microscopical Society in the Hastings Hall of B.M.A. House, Tavistock Square, W.C.1, 5.30 p.m.

Feb. 16th.—Meeting of the Hertfordshire and Bedfordshire Division, N.V.M.A., at 70, Holywell Hill, St. Albans, 2.30 p.m.

Feb. 22nd.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at Edinburgh, 2.30 p.m.

Feb. 24th.—Annual Meeting of the Royal Counties Division, N.V.M.A., at Maidenhead (Skindles Hotel), 2.30 p.m.

Feb. 24th.—Annual Ball of the University of Liverpool Veterinary Society, at the Students' Union, 2, Bedford Street North, Liverpool, 3. Tickets, 7s. 6d., obtainable from Mr. L. A. Taylor, at the same address.

Mar. 8th.—Meeting of the Editorial Committee, N.V.M.A., 3 p.m.; meeting (*the next*) of the Editorial Executive Committee, 1.30 p.m.

Mar. 9th.—Annual Meeting of the South Eastern Division, N.V.M.A., at Maidstone (Royal Star Hotel), 2.30 p.m.

Next Meetings of Council and Standing Committees, N.V.M.A.

(*Committees at* 36, *Gordon Square, W.C.*1)

Wednesday, February 8th

11.0 a.m. Parliamentary and Public Relations Committee.
2.0 p.m. Organising Committee.
4.15 p.m. Home Appointments Committee.

Thursday, February 9th

10.0 a.m. Veterinary State Medicine Committee.
2.0 p.m. General Purposes and Finance Committee.

Friday, February 10th

11.0 a.m. **Council Meeting** at the Connaught Rooms, Great Queen Street.

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SUPPLEMENTARY VETERINARY REGISTER

Relations between Veterinary Surgeons and Persons Entered on this Register

In view of its importance, the statement regarding the above, which appeared in our last issue, is repeated as follows:

It being considered necessary that the position of persons registered in the Supplementary Veterinary Register and their relation with persons registered in the Register of Veterinary Surgeons should be made clear, the Council R.C.V.S. makes the following announcement to the profession.

" The guide to professional conduct published by the Council is applicable to all persons registered on the Supplementary Veterinary Register except where the sense makes it clear that the reference is to registered veterinary surgeons only.

If there is any doubt the Registrar should be written to.

In interpreting Byelaw 53 (iii) and (iv) and the resolutions explained in the same (see paragraphs 4 and 5 on pages 1 and 2 of the published guide), a person registered in the Supplementary Veterinary Register shall not be deemed to be an unqualified or unregistered person.

In general, a registered veterinary surgeon may enter into partnership with, employ, act as consultant to, or be employed by, a person registered in the Supplementary Veterinary Register. In any such professional relationship the Veterinary Surgeons Act, 1948, must be complied with and such relationship must not lead anyone to the belief that any person registered in the Supplementary Veterinary Register is registered in the Register of Veterinary Surgeons, or possesses any veterinary qualifications which he does not in fact possess."

R.C.V.S. OBITUARY

Gofton, Arthur, F.R.C.V.S., 458, Lanark Road, Juniper Green, Midlothian. Graduated Edinburgh, May 29th, 1899; Fellowship December 3rd, 1910. Died January 26th, 1950; aged 71 years.

Mr. Arthur Gofton, F.R.C.V.S.

Deep regret will be felt throughout the profession at the death of Mr. Arthur Gofton, Chief Veterinary Inspector to the Corporation of Edinburgh from 1914-44 and who previously held in succession the Chairs of Surgery and of Medicine in the Royal (Dick) Veterinary College. A memoir will appear in an early issue, but we may now record that Mr. Gofton's abilities and the impressive qualities of his mind and character were honoured by his fellow members in his election as President of the National Veterinary Medical Association (1924-25) and as Vice-President of the Royal College of Veterinary Surgeons (1926-28). His activities as a Member of the Council of the Royal College from 1916-29 include the chairmanship of the Examination and Parliamentary Committees, while he was an Examiner for the Fellowship Diploma. His election as President of the N.V.M.A. was made at the outstandingly successful Congress at Aberdeen, when tribute was paid to one who had been prominently associated with the late Dr. O. Charnock Bradley in the reorganisation of the Association.

In due course fuller reference will be made to Mr. Gofton's work in the sphere of veterinary public health, where his main interests were reflected in his pioneer efforts for the eradication of tuberculosis in bovines and in the production of clean milk; also in his membership of the Departmental Committee of Enquiry into the system and standards of Meat Inspection in Scotland, 1921.

The Funeral Service

The funeral service, as befitted the character of the man, was simple and impressive. It was conducted by the Rev. Wallace B. Tavener at Warriston Crematorium, Edinburgh, on Saturday, January 28th.

The chief mourners were Mrs. Gofton, Dr. and Mrs. Edward Gofton, Tynemouth (brother and sister-in-law), Mr. Philip Gofton, Liverpool (brother) and Messrs. John and Raymond Gofton (nephews).

Among a large attendance, the Royal College of Veterinary Surgeons was represented by the President, Professor T. Dalling; the Royal (Dick) Veterinary College and the N.V.M.A. by Principal Mitchell; the Glasgow Veterinary School by Mr. W. L. Weipers; the Animal Diseases Research Association by the Director, Dr. J. Russell Greig, and the Secretary, Mr. A. R. Milroy; the Ministry of Agriculture and Fisheries by Mr. J. N. Ritchie, and the Edinburgh Public Health Department by Mr. J. Norval and Dr. Gammie. Other members of the veterinary profession included Mr. T. Bannatyne, Professor Boddie, Messrs. W. H. Horne, S. Jennings, W. W. Peggie, D. S. Rabagliati, Professor Robertson, Messrs. S. Sharp, J. T. Stamp and E. G. Wood.

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PERSONAL

Dr. T. K. Ewer: Appointment to the Chair of Animal Husbandry in the University of Queensland

We have pleasure in announcing that Dr. T. K. Ewer, at present carrying out research work in Cambridge with a Fellowship awarded by the Animal Health Trust, has been appointed to the Chair of Animal Husbandry in the University of Queensland, Brisbane. We understand that Dr. Ewer will be in charge of the veterinary school at Brisbane and that the present three years pre-clinical training in the University of Queensland will now be extended, for a further two years, to cover animal husbandry and the clinical subjects. At present the veterinary school is on a 60 acre estate in the city, but the final years will be carried out on a 600 acre site situated ten miles out and to be developed for this purpose.

Mr. Ewer, who was born in England, went to Australia and qualified in 1937 at Sydney University. At the beginning of 1938 he went to New Zealand as Veterinary Research Officer in the Department of Agriculture and in 1940 was in charge of the Kirwee Experiment Farm which was carrying out controlled investigational work on sheep mortality. In 1947 he was awarded a B.O.C.M. Fellowship by the Animal Health Trust for work on nutritional problems of sheep, and last year the Trust awarded him an I.C.I. Fellowship for the continuation of this work. He was recently awarded the Ph.D. degree of the University of Cambridge for a thesis on "Studies in Ovine Rickets." For the time being Dr. Ewer will continue his work at Cambridge, leaving for Australia probably in May or June.

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Births.—Calder.—On January 3rd, 1950, to Muriel and James Calder, a son.

Creasey.—On January 17th, 1950, at Holbeach Hospital, to Margaret (*née* Galbreath, M.R.C.V.S.), wife of Ronald F. Creasey, M.R.C.V.S., of Long Sutton, Lincs, a son—Gordon Hamilton.

Marriage.—Dymock—Harvey.—At Broomhill Parish Church, Glasgow, on January 23rd, 1950, by the Rev. D. Mackenzie Buchanan, M.A., William H. Dymock, M.R.C.V.S., son of Mr. and Mrs. James Dymock, 19, Pitt Street, Edinburgh, to Enid, daughter of Mr. and Mrs. George Harvey, 31, Dane's Drive, Glasgow, W.4.

Solomon—Widrich.—The marriage of Susanne, younger daughter of Mr. and Mrs. E. Widrich, of 3, Wellington Court, London, N.W.8, to Dennis Solomon, son of Mr. and Mrs. I. Solomon, of Pretoria, took place in Capetown, South Africa, January, 1950.

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Dr. James Carmichael, of the Veterinary Research Division of Messrs. May and Baker, Ltd., recently has been elected to the Council of the Royal Society of Tropical Medicine and Hygiene. Dr. Carmichael has been a Fellow of the Society for approximately 20 years.

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Compound Feeding-Stuffs Conference

The President, the Senior Vice-President, the Hon. Secretary and other representatives of the N.V.M.A., were among those who accepted the invitation of the President and Council of the Compound Animal Feeding-stuffs Manufacturers' National Association to a conference on January 26th. The subject was "Mineral Mixtures in Compound Feeding-stuffs," and the hall of the Wellcome Research Institute, Euston Road, N.W.1, was filled to capacity. The conference was opened by Mr. A. W. Brown, President of the C.A.F.S.M.N.A., who welcomed the speakers and members of the audience. Dr. H. H. Green, of the Veterinary Laboratory, Weybridge, then gave a "General Survey of Minerals in Relation to Animal Nutrition," during the course of which he referred to such conditions as osteoporosis and osteomalacia, hypomagnesaemia and hypocalcaemia, and the cobalt, copper iron, iodine and manganese requirements.

Mr. J. B. E. Patterson, M.Sc., F.R.I.C., Provincial Advisory Soil Chemist, South-Western Area, referred to work on cobalt deficiency carried out on farms on Bodmin Moor, Dartmoor and Exmoor, and described some controlled experiments with sheep made on a Bodmin Moor Farm. All but two of the "moor sick" controls died, whereas the other 20, which were receiving supplementary cobalt, put on 38 lb. (average) weight over the period of the experiment. Slides were used to illustrate the striking difference between treated and untreated animals of the same age and initial live-weight, and similar results were shown in a colour film made on the Bodmin Moor Farm. The film also brought out the fact that a top-dressing of cobalt, applied to the land once every three years, offers a cheap and effective alternative to drenching sheep or offering them a trough-fed mineral supplement, which, incidentally, the animals will go a long distance of their own accord to obtain.

Dr. Ruth Allcroft, of the Veterinary Laboratory, Weybridge, speaking on "Conditioned Copper Deficiency of Ruminants in Britain," illustrated by means of slides the lesions of cerebral demyelination occurring in "swayback" of lambs, and stated that in cattle evidence of hypocupraemia was found in a third of the 94 herds so far examined. Veterinary Investigation Officers, in conjunction with the laboratory at Weybridge, were now engaged on a survey. In Caithness hypocupraemic disorders were liable to occur on 75 per cent. of farms. Calves of the beef breeds there showed a stilted gait and progressive unthriftiness. The black hair around the eyes turned grey, in some cases, giving the calves a "spectacled" appearance. Scouring was not a prominent symptom as it was in the case of hypocupraemic stock elsewhere. On the Shropshire-Cheshire border, among other places, stunted growth was a marked feature, and two-year-old heifers could be mistaken for eight-month-old calves. Details of controlled experiments were given, and it was shown that the condition cou'd be avoided by feeding or injecting copper salts. A warning was given concerning the danger of the indiscriminate use of copper dressings for the land; copper poisoning might arise as it had done in Kent, where sheep had died following the use of copper-sprays in the orchards.

Mr. J. K. Dow, Agricultural Adviser to a Compound Manufacturer, then spoke on "The Practical Problems of Compound Manufacturers," and was followed by Mr. F. E. Corrie, B.Sc. (Agric.), Agricultural Consultant, on "Views of Mineral Supplement Manufacturers."

In the general discussion and questions which followed there was some controversy over "blunderbuss" mineral mixtures containing a selection of all the necessary minerals and trace elements. Some thought the "blunderbuss" mixture was wasteful—an opinion expressed by Mr. Patterson—and that it would be better to issue "regional mixtures."

The question was raised as to whether iodides should or should not be included in mineral mixtures, and after some disagreement on the subject Dr. Green emphasised the small quantities necessary, the wide margin between normal requirements and toxic doses, and

indicated that inclusion of traces of iodine in mineral mixtures was likely to be advantageous.

The practice of the Scottish Department of Agriculture in recommending feeding magnesium supplements to prevent hypomagnesaemia was called in question, but Sir James Scott Watson, who summed up the proceedings, thought that it was too early to be dogmatic on that subject. Our knowledge of the mineral requirements of animals was rather less advanced than that concerning plants. Much work remained to be done, and an open mind must be kept on the subject. How many, a few years ago, would have thought copper deficiency a serious condition in this country?

G. P. W.

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DUMFRIES AND GALLOWAY LADIES' GUILD DANCE

The Dumfries and Galloway section of the Ladies' Guild held their fourth annual dance in the Cairndale Hotel, Dumfries, on Friday, December 30th. There was the usual good attendance of members and friends from as far west as Wigtown and Stranraer and as far south as Penrith.

Mr. McQuen again presented a sheepskin and Mr. Hector, President of the Dumfries and Galloway Division, sent two presents. These gifts were raffled. As a result of the raffle, the dance and donations, a sum of £70 has been forwarded to Mrs. W. M. Mitchell, Edinburgh, for the funds of the V.V.B.F. Ladies' Guild.

The Committee take this opportunity of thanking all friends for their generous support; also of expressing regret to the members who were unable to obtain tickets and to those who did not obtain as many tickets as they asked for, but they beg to point out that the accommodation in the Cairndale is limited.

Winifred H. Sangster.

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AGENE TREATMENT OF FLOUR

Discontinuance Recommended but a Public Assurance Given

The view that the use of nitrogen trichloride, known as agene, should be discontinued in the treatment of flour is expressed in the report of a scientific committee which has been reviewing its effects on the public.

This committee, under the chairmanship of Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, and comprising representatives of the Ministries of Food and Health, the Medical Research Council, and the milling industry, has for some time been engaged on a review of the available evidence regarding any possible toxic effects of this commonly used flour improver. The reason for this review was the discovery that the feeding of large quantities of flour treated with agene caused severe toxic symptoms in dogs and certain less severe symptoms in a few other animal species, *e.g.*, rabbits.

The committee has been unable to find any evidence that agenised flour is in any way toxic to man; experiments carried out both in this country and in the United States have failed to produce any toxic symptoms, even where heavily treated flour has been fed at a high level. Nevertheless, in view of its deleterious effect on certain animals, the committee has felt that the use of agene should be discontinued.

The committee is, however, satisfied that if a loaf acceptable to the general public is to be produced in this country some form of "improver" must continue to be used to safeguard its baking qualities. There exists a suitable substitute in the form of chlorine dioxide. Extensive tests have shown that flour treated with this improver, which is used in quantities of less than 30 parts per million, causes no toxic symptoms in either animals or man. The committee has, therefore, recommended that this improver should be adopted in the United Kingdom in place of agene. This recommendation has been accepted by the Ministries of Food and Health and by the milling industry.

It will be understood that a change in technique which affects over 90 per cent. of the flour used in this country cannot be effected overnight. The position is complicated by the fact that the necessary plant and supplies of the new improver have to be secured from the United States. Every effort is, however, being made to accelerate the change, in the execution of which the representatives of the milling industry have given an assurance of their fullest co-operation.

In the meantime (says the joint announcement by the Ministry of Health and Ministry of Food) the public can be assured that the present methods of treatment of flour, which have been in operation in this country, the United States and Canada for some 25 years, and which include agenisation, have not been proved to be injurious in any way to human health.

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LEGAL NOTES

Veterinary Surgeon's Kennels: Interdiction Against Use During Summer Months.—Mr. Robert Stevenson Naismith, 6, St. Mary's Place, St. Andrews, has been forbidden to keep dogs in kennels on his premises during the summer months.

In a judgment issued on January 11th at Cupar (states the *Glasgow Herald*), sheriff-substitute J. W. More has upheld the plea of near neighbours, Mr. David Milne and his wife Margaret, joint owners of the Station Hotel, that the dogs provided a nuisance to themselves and to their guests. Sheriff More said that the good name of the pursuer's hotel was in danger of being prejudiced by the disturbance caused by the dogs and he interdicted the defender as owner and occupier of 6, St. Mary's Place and all others acting under his authority from maintaining during the period from May 1st to September 30th, kennels for the reception of dogs whether belonging to himself or third parties.

In a note the sheriff refutes a suggestion made for the defender that the locality was not residential. To most ordinary people the occasional barking of a dog was sufficiently annoying, but as he believed from the evidence in this case there had been a disturbance of a chorus of more than a score of dogs, the noise was sufficient not only to disturb the pursuers but to call for protests from many of their guests.

It was unreasonable to suggest, as had been done during cross-examination of Mr. Milne, that if possible customers objected to the dogs they could go elsewhere. It had been equally unreasonable to suggest to another of the pursuer's witnesses that if the dogs disturbed his sleep he should upset his domestic arrangements and sleep at the front of his house instead of at the back.

Sheriff More found the defender liable in expenses.

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VETERINARY COLLEGE OF IRELAND PRIZE DISTRIBUTION

The Principal, Professor T. G. Browne, speaking on the occasion of the presentation of prizes and medals held in the College at Ballsbridge, Dublin, said that the students had maintained a high standard during the past year. It was very difficult to draw comparisons between graduates of the present day and those of 20 years ago. Most subjects had been extended very considerably, with the exception of anatomy. Other new subjects had been added, for example, biochemistry, embryology and parasitology.

However, it could be stated without doubt that the modern graduate was better equipped, for the equipment of the College was better and the teaching staff had been increased.

Awards and Medals

Of the special awards for pathology, the Mettam and the Kehoe Memorial Prizes went to J. K. Kealy, and the Freeman Medal to F. Mahon. The Veterinary Medical Association of Ireland Silver Medal was awarded to J. A. Stephenson, and the bursary was won by C. Hatch.

Medals were awarded to the following: *Final Year*—N. Connors (surgery and meat inspection), C. A. Murdock (medicine) J. J. Fanning (surgery), J. A. Devereux (obstetrics), T. J. Thornton and J. A. Stephenson (clinical medicine and surgery).

Fourth Year—J. K. Kealy (pathology and parasitology), J. P. O'Connor (do.). *Third Year*—S. F. M. Davies (hygiene and materia medica), J. P. Keating (hygiene), R. W. Kirkpatrick and D. F. O'Connell (animal management). *Second Year*—J. S. Cosgrove (physiology and senior anatomy), J. H. Agnew (do.), M. A. Petris (histology). *First Year*—C. Hatch (chemistry, biology, junior anatomy, practical chemistry), B. McAuley (chemistry and junior anatomy), T. J. Tubridy (biology).

Following the presentation of prizes, Dr. J. McGrath, State Pathologist, delivered an illustrated lecture on "Forensic Problems common in human and veterinary practice."

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BRITISH HORSE SOCIETY AND DRESSAGE TESTS

The current issue of *The Horse and Pony News* records that at a meeting of the appropriate Committee of the British Horse Society the Championship conditions were discussed and it was decided that:—

1. In the B.H.S. Championship, horses will not be allowed to take part in more than one test and it is recommended that the same rule should be adopted by other shows holding Dressage tests.
2. A register of animals taking part in Dressage classes should be opened and, to start the register, it was decided to ask all those who have had horses placed in Dressage tests since January 1st, 1947, to send in details of their animals and the awards gained.
3. A register of awards should be kept and that shows would be asked to lodge a catalogue giving the winners.
4. Shows having classes under B.H.S. Dressage Rules should:—
   (*a*) submit their draft schedules to the Committee,
   (*b*) submit the names of judges,
   (*c*) offer either B.H.S. tests or tests approved by the Committee.

It was resolved to call a meeting in due course, to which would be invited representatives of the various groups and clubs interested in Dressage, but that this meeting should not be held until the conditions of the official Novice test had been decided upon.

INTERNATIONAL HORSE SHOW

The British Horse Society announces in its journal that approval has now been received from the F.E.I. for the 1950 Show to be held at the White City Stadium, London, from Saturday, July 22nd, to Friday, July 28th, inclusive. The change from the provisional dates, one week later, was made as it is hoped that it will be possible for H.M. the King to open the Show. Her Royal Highness Princess Elizabeth may now also be able to present her Challenge Cup (International Jumping Championship for Lady Riders) on Tuesday afternoon, July 25th.

Gala performances will therefore be held on Tuesday afternoon, July 25th, Wednesday evening, July 26th (King George V Challenge Cup), Thursday afternoon, July 27th (Prince of Wales Challenge Cup—International Teams), and the final performance on Friday evening, July 28th. The grand opening performance, Saturday afternoon, July 22nd, will not be considered as a Gala.

Acceptances to compete have been received from Belgium and France, invitations having also been sent to Ireland, Italy, Mexico, Spain and Switzerland. High-Class International Jumping Competitions are therefore anticipated.

Subscriptions to the Members' Club will again be five guineas to Members of the British Horse Society and six guineas to the general public, only if, after June 1st, the Club is not full. Application forms for Club Membership and full Schedules are expected to be ready early in March, and may be obtained from the Secretary, 66, Sloane Street, S.W.1. Telephone: Sloane 9773.

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ATTESTED TARGET FOR THE WEST

"To-day, dairy farmers have so stepped-up production that they have already reached the 1952 target and it has been possible to scrap milk rationing," observes the *Western Morning News* in commenting on the Milk Report of the Joint B.M.A.—N.V.M.A. Committee, and continues; "That being so, this would seem a fitting time to start seriously tackling this question of wastage by culling the poor milkers and diseased animals, and, above all, aiming at tuberculin-tested herds.

"The West country has long been famous for its dairying. Its milk, butter, and cream held a wide and popular reputation. But, unfortunately, its record of attested herds has been small. The Isles of Scilly gave a magnificent lead last year by being amongst the first places to have 100 per cent. attested herds. That may be much more difficult on the mainland, but it is an ideal to which Devon and Cornwall dairy farmers might well subscribe."

* * * * *

PREGNANCY TOXAEMIAS IN ANIMALS

A symposium on the toxaemias of pregnancy was held at the House of the Ciba Foundation on January 12th, 13th and 14th. Professors A. St. G. Huggett, W. C. W. Nixon and E. C. Amoroso, in co-operation with Dr. G. E. W. Wolstenholme, secretary of the executive council of the Ciba Foundation, were responsible for organising this symposium. In the invited audience there were physiologists, veterinarians, obstetricians, physicians, pathologists, endocrinologists and biochemists.

At the second session (reports the *British Medical Journal*) with Dr. H. H. Green in the chair, Mr. H. B. Parry described the toxaemias affecting sheep. He said there were two groups of disorders: First, in many species there was the group of conditions associated with mineral imbalance and causing neuromuscular disturbances, seen mainly at parturition and in the puerperium; included in this group were milk fever, lactation tetany and lambing sickness. The second group of disorders was confined to ewes in the latter half of pregnancy and was manifested by stupor, blindness, ketosis and —*post mortem*—a fatty liver. In large-scale field trials in Australia, with restriction of exercise in ewes with twins or a heavy single lamb, and with sudden changes of food intake, this second type of toxaemia had been induced experimentally.

Dr. A. T. Phillipson said that in ewes a form of pregnancy toxaemia, with weakness, anorexia, deranged nervous co-ordination, ketonaemia and hyperglycaemia, acetone in the breath and ketonuria, and—*post mortem*—a grossly fatty liver, could be produced experimentally by certain feeding and fasting measures. This appeared to suggest that ewes in which the foetus made big demands developed toxaemia when they failed to accommodate sufficiently rapidly to sudden changes in diet.

Dr. J. Duckworth emphasised the speed with which low calcium states could be induced. Very low calcium diets did not affect the health or reproductive capacity of rats, and had no effect upon the size or viability of the litter. But the withdrawal of minerals from the skeleton over three gestation-lactation cycles amounted to as much as 60 per cent.

Dr. Ruth Allcroft described the neonatal ataxia of lambs. This was a type of spastic paralysis, due to hypocupraemia in the mothers, which were unaffected. A similar disorder in bovines also affected the calves only, but not as severely as the lambs. In affected lambs gross demyelination of whole hemispheres occurred.

Mr. A. Messervy discussed the practical problems of milk fever, which was due, in his opinion, to over-lactation. There was a satisfactory response to injections of glucose solution or to inflation of the udder, but it was also essential that the animals should be put out to grass.

Professor A. Robertson, in a paper on the biochemical aspects of bovine parturient hypocalcaemia, mentioned some studies which were being made of blood calcium, phosphorus and magnesium levels in normal bovine pregnancies and in cases of milk fever. Marked changes had been noted, but they were not regarded as primarily responsible for the condition, and an investigation of the hormonal factors that might be concerned had begun. He described some interesting changes in mineral balance after the treatment of milk fever by inflation of the udder.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

IS ATTESTATION A GOOD POLICY?

Sir,—It has occurred to me during the last few years that we are in a fair way to eradicate tuberculosis from dairy cattle, and I have frequently contemplated what results this will have on human beings. There is no doubt that it is a good thing for a cow, or a herd, to be free from this disease, but we must not forget that a cow can live a long and useful life while harbouring the tubercle bacillus; in fact it used to be said, and I think truly, that some infection produces an immunity against a new importation of the infection in the same animal. Likewise in human beings it has been established for many years that most individuals acquire the disease, probably early in life, but the lesion heals up and gives the person a higher resistance to the same infection for the rest of his life.

In the last few weeks I have established that in the areas of the county where the incidence of tuberculosis is lowest in cattle, there is a relatively higher percentage of tuberculous infection in human beings—I mean tuberculosis of human type.

The following are figures issued by the National Association for the Prevention of Tuberculosis. Quotation: "Although the English death-rate from tuberculosis is falling, Scottish rates are rising. In the year 1939, for instance, 2,717 people died from lung tuberculosis in Scotland, but in 1948 the corresponding figure was 3,417. Since the war more new cases are being notified. More than 2,500 patients with grave tuberculosis await sanatorium treatment in Scotland. At the present time some of her tuberculosis statistics are the worst Scotland has known for the past half century."

Further quotation: "In 1898, 70,000 British lives were lost through tuberculosis. Half a century later, in 1948, the corresponding figure was less than 23,000, although meanwhile the population had risen from 36,000,000 to 48,000,000."

A further personal quotation from the Parliamentary Secretary to the Ministry of Food (22.11.49) reveals the comparison between the bovine and human types existant in the last four years:—

Tuberculosis rates per 100,000 *of the population*

	England and Wales		Scotland	
Year	*Bovine*	*Respiratory*	*Bovine*	*Respiratory*
1945 ...	10·0	51·5 ...	18	60
1946 ...	8·3	46·8 ...	15	64
1947 ...	7·9	47·3 ...	14	66
1948 ...	6·7	44·0 ...	9	66

The 1948 figures are provisional.

From these quotations it is obvious that the respiratory (human type) percentage is increasing in Scotland, whilst the bovine type has been reduced to half, but in England and Wales the respiratory type has decreased considerably, whilst the bovine type has not shown as great a reduction as in Scotland.

It is fairly safe to say that, taking Scotland as a whole, 80 per cent. of the cattle are attested (*Vet. Rec.*, 28.1.50), whilst in England and Wales (it is impossible to get separate figures for Wales) the figures would be considerably under 20 per cent.

There must be a relationship between the human and bovine figures for Scotland and the rest of the country, and it seems to me

that the removal of tuberculin (I do not mean the tubercle bacillus) from the milk in Scotland has considerably lessened resistance to tuberculosis in human beings there, whilst in England and Wales there is still enough to provide this assumed immunity.

Tuberculin as used above, is, I feel sure, the inactivator of the human bacillus, and all cows which are infected must produce large quantities of it. Obviously open cases such as infection of the udder and coughing type must be removed because of the immediate danger to other cattle and human beings. But the tuberculin would follow the circulation and reach the udder and by this route reach the consumer and thereby confer a greater immunity than without such tuberculin.

Pasteurisation is said to destroy the bacillus of tuberculosis, but it is quite probable that tuberculin is not destroyed and remains as an antidote against the bacillus.

In my view more frequent clinical examinations at intervals of not more than three months should be made in preference to the tendency to accept herd owners' requests to have their herds tuberculin tested.

Certainly animal life is subsidiary to human needs, and it must promote a false sense of security to eradicate an infection from an animal if by so doing we are making human beings more prone to a more serious disease and its consequences.

Since writing the above, the following figures have been issued by the National Association for the Prevention of Tuberculosis. These, I think, emphasise still further the loss of resistance in human beings as a result of losing the excreta (tuberculin) of the bacillus of tuberculosis.

NOTIFICATION OF TUBERCULOSIS

Year	Respiratory	Non-respiratory	Total
England and Wales			
1924	57,503	18,698	76,201
1925	58,299	19,204	77,503
1926	55,980	17,684	73,664
1927	53,818	17,684	71,502
1928	52,837	17,955	70,792
1929	52,380	16,502	68,882
1930	50,322	16,781	67,103
1931	49,506	16,068	65,574
1932	46,579	15,499	62,078
1933	44,482	14,095	58,577
1934	43,034	13,694	56,728
1935	39,635	12,435	52,970
1936	39,336	12,268	51,604
1937	39,630	12,661	52,291
1938	37,879	12,810	50,689
1939	34,930	11,276	46,206
1940	36,151	10,421	46,572
1941	39,499	11,465	50,964
1942	40,629	11,990	52,619
1943	42,410	11,932	54,342
1944	43,794	10,519	54,313
1945	42,166	9,944	52,110
1946	42,173	9,116	51,289
1947			
Scotland			
1928	6,203	4,682	10,885
1929	6,112	4,228	10,340
1930	5,671	4,242	9,913
193.	5,634	3,966	9,600
1932	5,537	3,909	9,446
1933	5,313	3,297	8,610
1934	4,985	3,066	8,051
1935	4,939	2,951	7,890
1936	4,736	3,019	7,755
1937	4,775	2,809	7,584
1938	4,793	2,772	7,565
1939	4,657	2,440	7,097
1940	5,212	2,510	7,722
1941	5,739	2,555	8,294
1942	6,224	2,824	9,048
1943	7,215	2,873	10,088
1944	7,282	2,651	9,933
1945	7,316	2,342	9,658
1946	7,627	2,086	9,713
1947	7,984	2,133	10,117
1948			

Yours faithfully,
L. PITCHER, M.R.C.V.S.

66, Coningsby Road, High Wycombe, Bucks.
December 12th, 1949.

UNDULANT FEVER

Sir,—The *Record* takes some time to reach me and the subject of undulant fever may have been dropped by now, but it may still be of interest to record that I contracted undulant fever in September, 1949, the symptoms being similar to those of influenza but pain in the lower back and knees was marked and the temperature rose to 102·4°. Blood cultures revealed *Brucella abortus* of the Rhodesian type, I being the second person from whom this type has been isolated in this country. After ten days I was given a course of aureomycin (Lederle), the first dose being 16 capsules followed by two every four hours: 50 capsules in all, that being all my doctor could obtain at the time. I then went from 5,500 feet down to sea level and had two very mild recurrences at monthly intervals; the third and fourth month no symptoms were noticed but at the end of the fifth month (by which time I had been back at 5,500 feet for two months) I suffered a relapse equally severe as the original attack. Again cultures proved positive and I went on to chloromycin (Parke Davis), the first dose being 16 capsules followed by one every three hours. It took seven days before the temperature remained normal when the dosage was reduced to one capsule three times daily for a further seven days and then one capsule twice daily for another 14 days. At 7s. per capsule and no National Health Service the whole business has been very costly. I would very much like to know whether Mr. Owen and Mr. Horrox had blood cultures done and whether recovery after using the above drugs confers any immunity.

Yours faithfully,
RONALD G. PEARSON.

P.O. Box 2359, Nairobi.
January 21st, 1950.

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ILLNESS IN HUSKIES

Sir,—I appreciate and take up the challenge in Mr. C. E. Woodrow's letter in your issue of January 7th. Having observed the classical symptoms of *Beta haemolytic streptococcus* tonsillitis in the huskies Mr. Woodrow took tonsil swabs of six of them. He sent in the swabs for laboratory examination. Since the laboratory report made no mention of the *B.H.S.* Mr. Woodrow inferred that the huskies were not suffering from *B.H.S.* tonsillitis. The equally valid inference that the results were due to errors in technique appears to have been overlooked; consequently a controlled re-swabbing of the dogs was not undertaken.

Veterinary surgeons, experienced in correlating tonsil-swab cultures with such symptoms as those recorded in the huskies, would have drawn at least a third inference from the laboratory report. They would have suspected three of the huskies of eructating or vomiting before the swabs were taken; consequently they would have analysed the faeces and vomits of each dog. Before he discarded conjoint infection by the *B.H.S.* and bowel parasites as the huskies' illness did Mr. Woodrow explore the inferences, and with what results?

Yours faithfully,
TOM HARE.

529a, Finchley Road, London, N.W.3.
January 24th, 1950.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV).

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Parasitic Mange*	Sheep Scab	Swine Fever
Total 1st to 15th January 1950 ...	13	—	10	—	5	—
Corresponding period in—						
1949 ...	12	—	15	—	3	1
1948 ...	3	—	37	—	6	2
1947 ...	1	20	—	—	4	2

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

Tuberculosis Order of 1938

The number of bovine animals slaughtered under the Tuberculosis Order of 1938 during the period October 1st to December 31st, 1949, was 1,376.